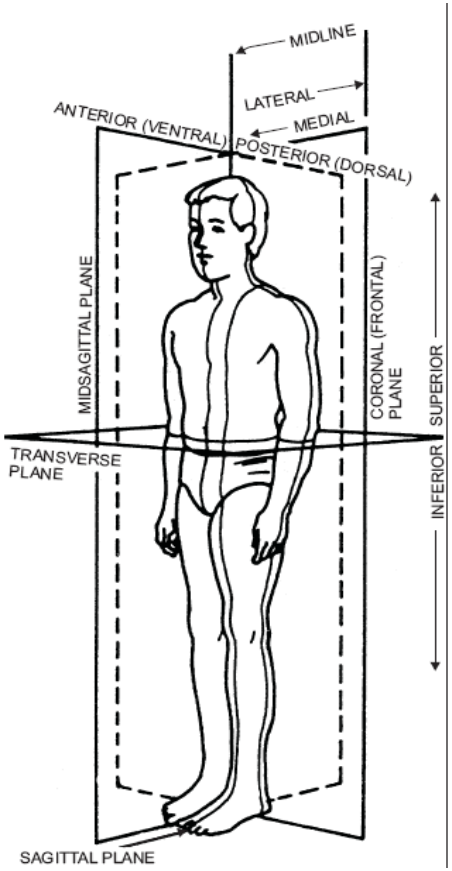
ANATOMY & PHYSIOLOGY

HM2 JENNIFER FRETZ

POSITION and DIRECTION OF THE BODY



- Median/Midsagittal: divides body into right and left side.
- Frontal: divide body into frontal and posterior sections.
- Transverse: divide body into upper superior) and lower (inferior) sections.

Anatomical Position

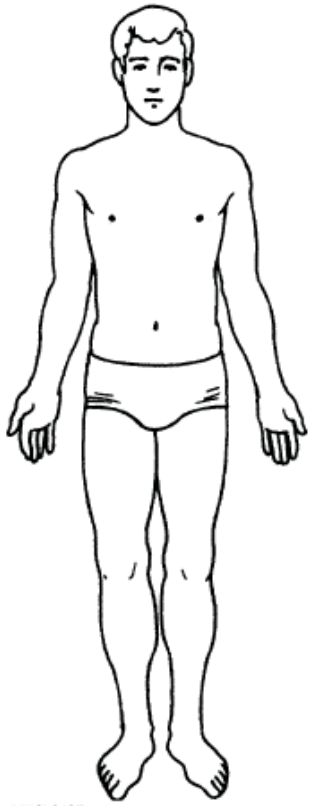


Figure 1-2.—Anatomical position.

- Anatomical position is assumed when the body stands erect with arms hanging at the sides with the palms of the hands turned forward.

Anatomical Terms

- Anterior/Ventral: toward the front.
- Posterior/Dorsal: back/rear of body.
- Medial: towards/near the middle of body.
- Lateral: Further away from middle of body.
- Internal: Inside.
- External: Outside.
- Proximal: Near the point of origin/closer to the body.
- Distal: Away from the point of origin/away from the body.
- Superior: Higher/above.
- Cranial: Towards the head.
- Caudal: Toward the lower end of the body.
- Inferior: Lower than/below.
- Erect: Standing.
- Supine: Lying down/face up.
- Prone: Lying down/face down.
- Lateral Recumbent: Lying down on your side.

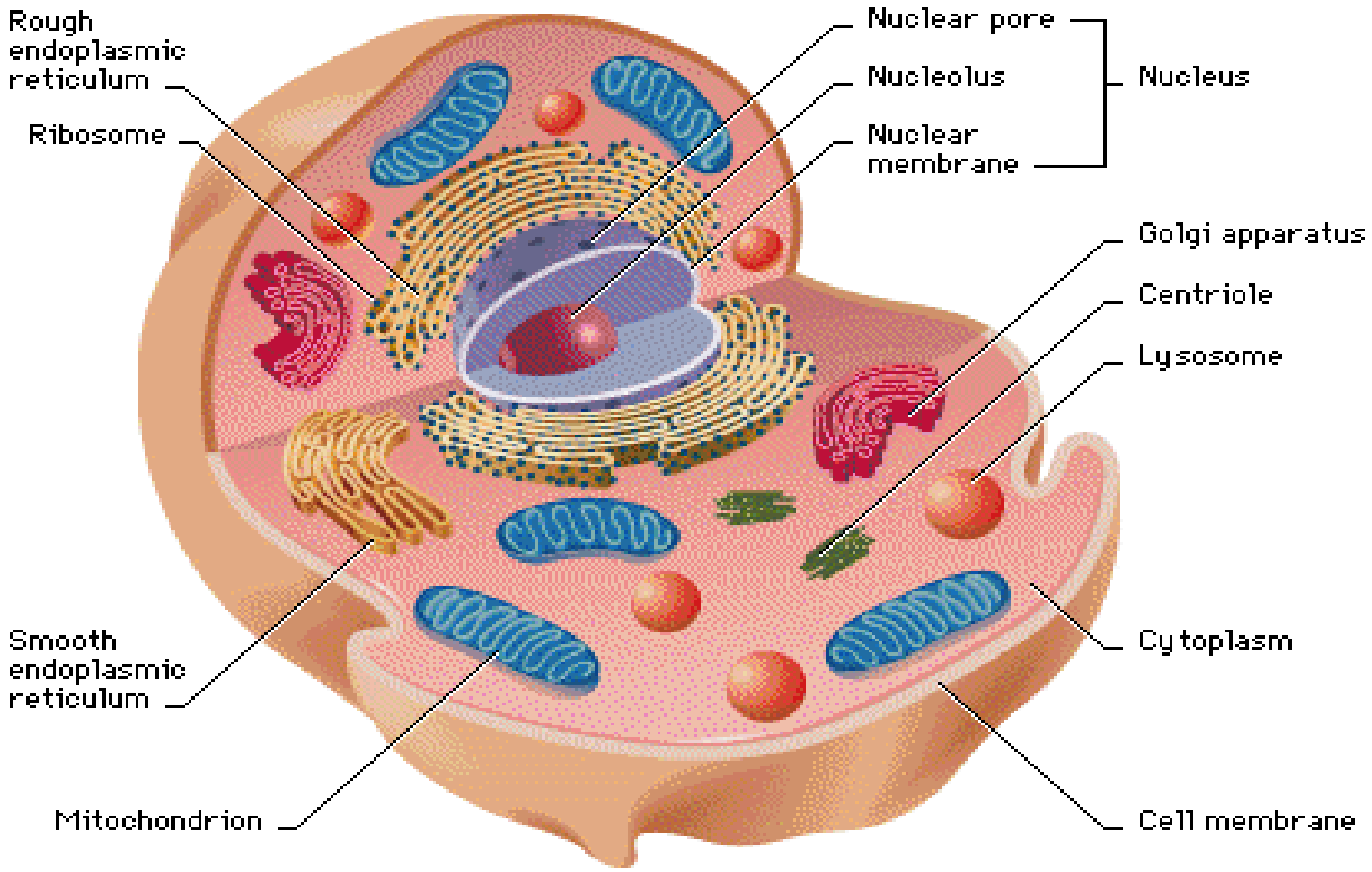
CELLS AND LIVING MATTER

BUILDING BLOCKS OF LIFE

Characteristics of Living Matter

- Necessary functions for life: Digestion, Metabolism, and Homeostasis.
- Digestion: Physical/Chemical breakdown of food into simplest forms.
- Metabolism: Process of absorption, storage, and use of food for body repair, growth, and maintained.
- Homeostasis: Body's self-regulated control of internal environment.

The Human Cell



Tissue

- Tissue are groups of specialized cells. There are four types.
- Epithelial Tissue.
- Connective Tissue.
- Muscular Tissue.
- Nerve Tissue.

Epithelial Tissue

- Epithelium is the lining tissue of the body.
- They are classified according to their shape, arrangements and function of their cells.
- Columnar.
- Squamous.
- Cuboidal.

Epithelial Tissue con’t

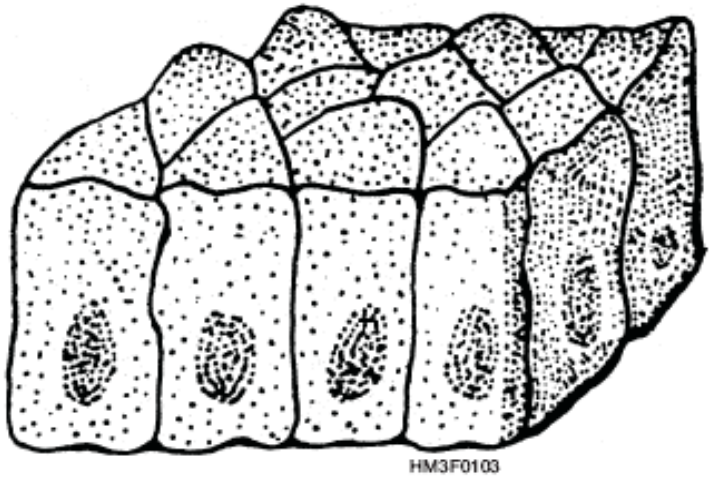


Figure 1-3.—Columnar epithelial tissue.

- Columnar Epithelial Tissue: elongated, longer than they are wide.
- They act as a barrier, preventing foreign matter from entering these cavities such as digestive tracts.

Epithelial Tissue con’t

- Squamous Epithelial Tissue: thin platelike or scale like cells.
- Ex: tympanic membrane.
- Cuboidal Epithelial Tissue: Cubed shape.
- Ex: ovary and the kidney’s.
- Function: secretion and absorption of fluid.

Connective Tissue

- Supporting tissue of the various structures of the body.
- Highly vascular.
- Aerolar.
- Adipose.
- Osseous.

Connective Tissue con’t

- Areolar Connective Tissue: Meshwork of thin fibers that interlace in all directions giving tissue both elasticity and strength.
- Chief Function: Bind parts of the body together.
- Found between muscles and an outside covering for blood vessels and nerves.
- Connects blood vessels and nerves to surrounding structures.

Connective Tissue con’t

- Adipose Connective Tissue: “Fatty Tissue”
- Reservoir for energy producing foods.
- Helps prevent heat loss.
- Support various organs.
- Osseous Connective Tissue: Bone Tissue.
- Dense fibrous connective tissue that forms tendons, cartilage, and bones.

MUSCLES AND BONES

Muscular Tissue

- Provides for all body movement.
- Skeletal.
- Smooth.
- Cardiac.

Skeletal Muscle Tissue

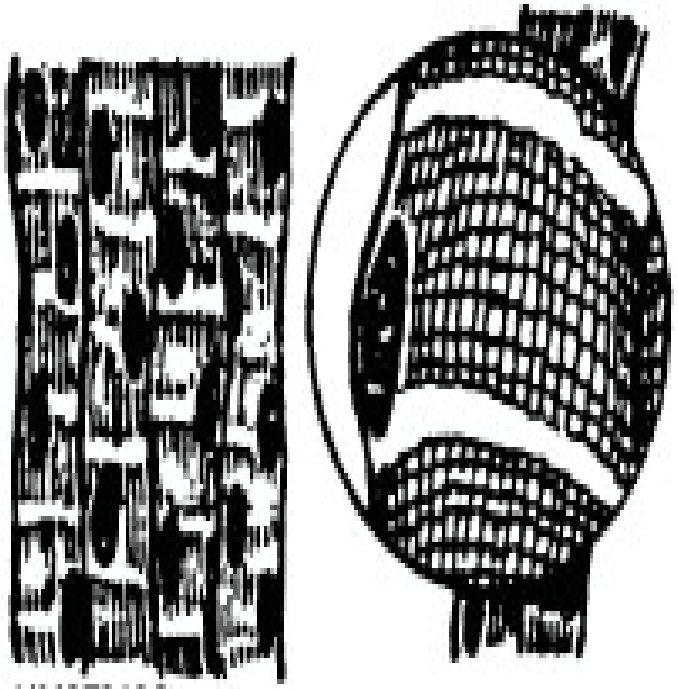


Figure 1-9.—Skeletal muscle tissue.

- Voluntary Muscle fiber. Under our own control.
- Usually attached to bone.

Smooth Muscle Tissue

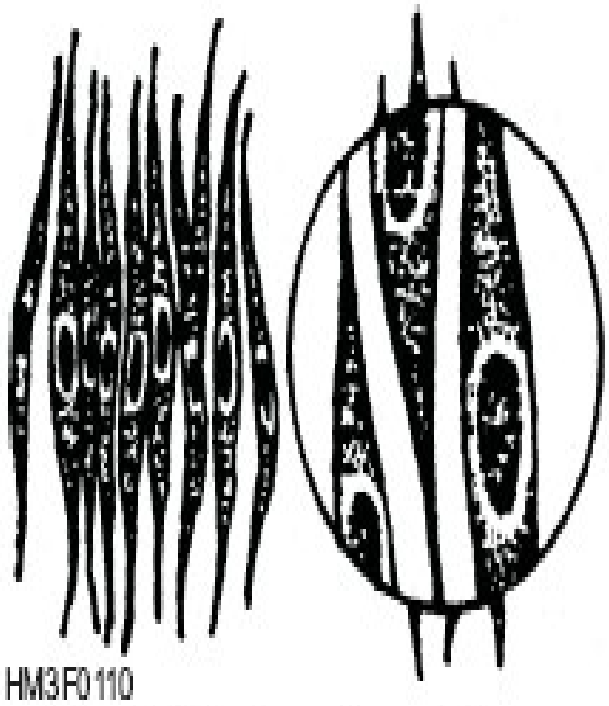
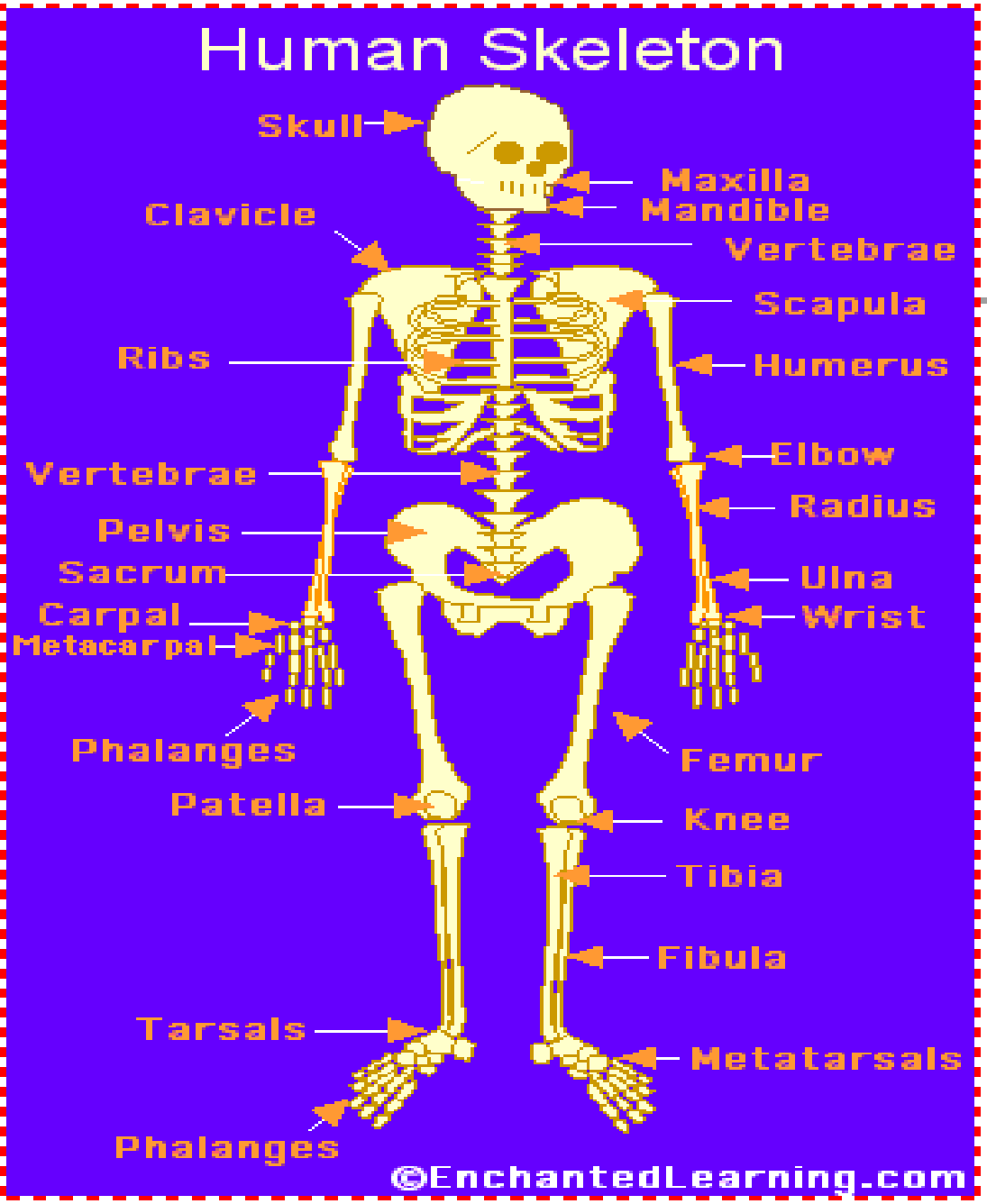


Figure 1-10.—Smooth muscle tissue.

- Smooth/Nonstriated.
- Not under our own control/Involuntary.
- Ex: Walls of hollow organs – stomach, intestines, blood vessels, and bladder.

Cardiac Muscle Tissue

- Involuntary.
- Located only in the Heart.
- Responsible for pumping blood into the heart chambers and certain blood vessels.



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- 206 bones in the human body.
- Supports and gives shape.
- Protects vital organs.
- Provides attachment. points for tendons, muscles, and ligaments.
- Have joints to provide movement.

Anatomy of Bones

- Bone is made up of an inorganic mineral salt – Ossein.
- Hard outer shell – Compact Bone.
- Inner spongy/porous portion: Calcellous tissue.
- Center of bone: Medullary cannel. Contains bone marrow.
- Yellow marrow – ordinary, fat cells.
- Red marrow – long bones and manufacture red blood cells.
- Periosteum - Thin outer membrane surrounding bone.
- Supplies bone with nutrients.

Types of Bones

- Long bones: femur and humerus.
- Short bones: wrist and ankle.
- Flat bones: skull, sternum, and scapula.
- Irregular bones: vertebrae, mandible, and pelvic bones.

Axial Skeleton

- Contains skull, vertebral columr and the thorax.
- Skull – 28 bones
- Facial – 14 bones and 13 immovable bone and movable lower jawbone.

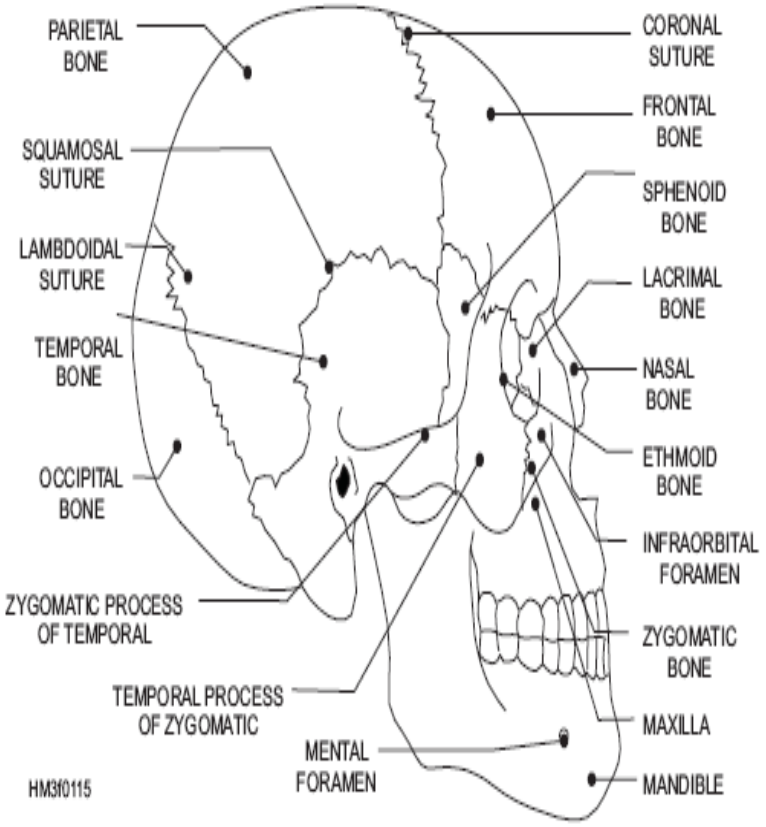
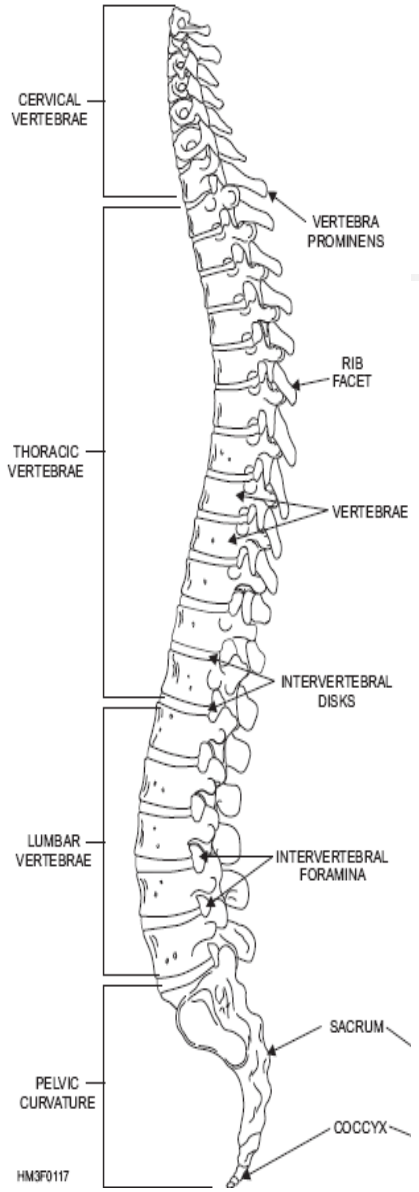


Figure 1-15.—Lateral view of the skull.

Spinal Column

- Atlas – first cervical vertebra.
- Axis – 2nd cervical vertebrae.
- Cervical – 7 vertebrae.
- Thoracic – 12 vertebrae.
- Lumbar – 5 vertebrae.



Thorax

- 12 ribs.
- First 7 pairs of ribs – true ribs. Attach to the Sternum.
- Remaining 5 pairs – False ribs. Cartilage does not reach the sternum.
- Last 2 – floating ribs. No cartilaginous attachment to the sternum.
- Xyphoid process: located inferior aspect of the sternum. NEVER press on it when giving CPR. You can break it off and push it into the liver or spleen.

Appendicular Skeleton.

BONE	COMMON NAME	TOTAL NUMBER IN BODY
clavicle	collar bone	2
scapula	shoulder blade	2
humerus	arm bone	2
radius and ulna	forearm bones	4
carpals	wrist bones	16
metacarpals	bones of the palm	10
phalanges	finger bones	28

- Bones of the upper and lower extremities.
- Upper extremity – arm, shoulder, forearm, wrist, and the hand.

Appendicular Skeleton con't

BONE	COMMON NAME	TOTAL NUMBER IN BODY
innominate	hip bone	2
femur	thigh bone	2
patella	knee cap	2
tibia	leg bone	2
fibula	leg bone	2
tarsals	ankle bones	14
metatarsals	foot bones	10
phalanges	toe bones	28

- Lower extremity – hip, thigh, leg, ankle, and foot bones.

Joints

- Classified according to movement.
- Immovable – bones of the skull. Fused together.
- Slightly movable – held together by broad flattened disks of cartilage and ligaments. E.g.: vertebrae/pubis.
- Freely movable – most joints in the body.
- Joints enclosed in water tight sac/membrane containing lubricating fluid.

Types of Joint Movement

- **Angular**
- **Flexion**
- **Extension**
- **Abduction**
- **Adduction**
- **Rotation**
- **Circumduction**

Types of Joint Movement con't

- Supination – placing palm up (make a soup bowl).
- Pronation – turning downward.
- Eversion – turning outward.
- Inversion – turning inward.

Muscles

- Muscle purpose determined by what type joint it is attached to.
- Provide movement.
- Maintaining body posture.
- Providing heat.
- Involved in bodily functions of respiration, blood circulation, digestion, speaking, and seeing.

Muscles con’t

- Contractibility – enables a muscle to become longer or shorter. Produces movement.
- Needs stimulus for this movement – excitability & irritability.
- Muscle fatigue – when a muscle contracts lactic acid builds up and make muscle irritable. If con’t then muscle will refuse to move.

Muscles con’t

- Tonicity – muscle tone.
- Isometric – contraction occurs without movement. (movement against a wall).
- Isotonic – muscle shortens and movement occurs. (lifting an object).
- Extensibility – capable of stretching when force applied.
- Elasticity – regaining their original shape when force is gone.

Muscle Tissue

- Skeletal – (striated) attached to bone and give body shape. Voluntary muscles.
- Smooth – Involuntary. In bladder, stomach, intestines, bladder, and blood vessels.
- Cardiac – Involuntary. Only found in heart.
- Cardiac – receive 2x blood as skeletal.
- Disruption of their blood supply can result in an MI.

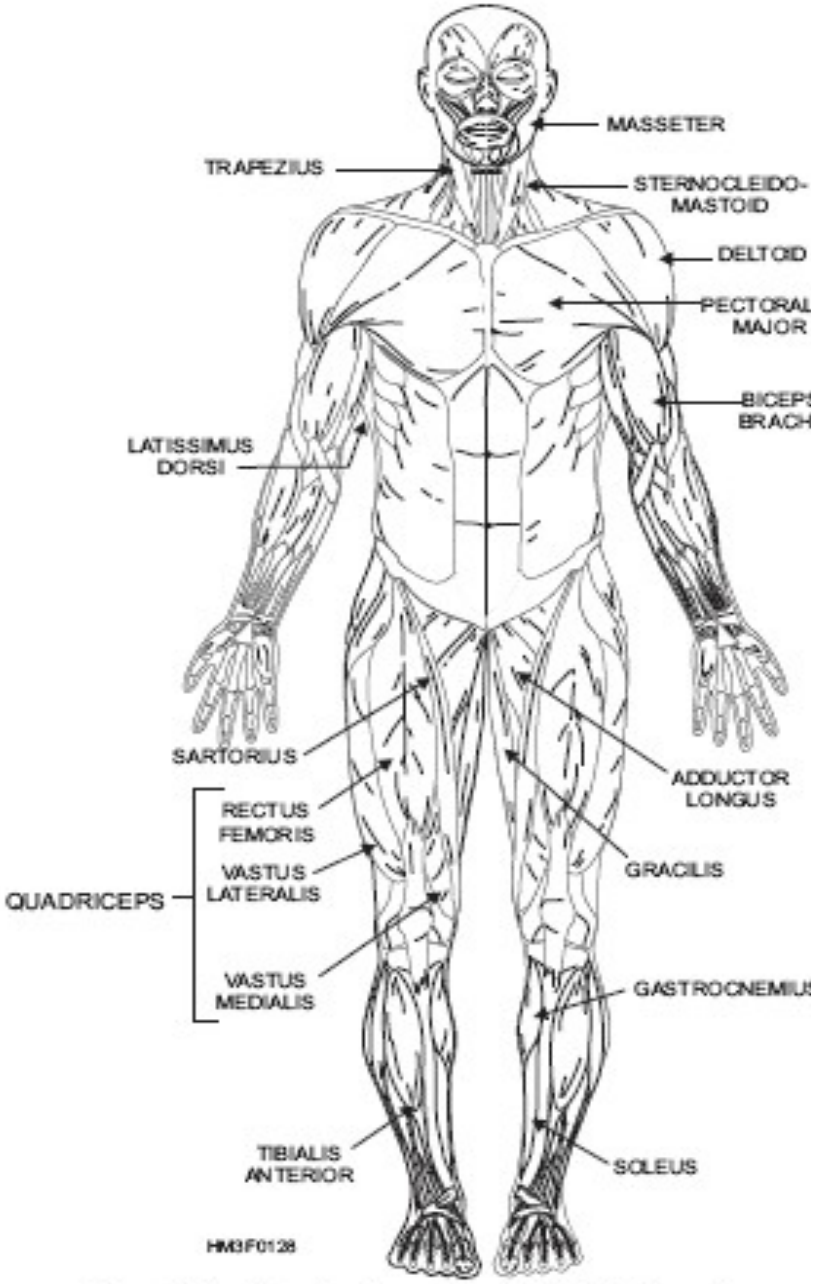


Figure 1-28.—Anterior view of superficial skeletal muscles.

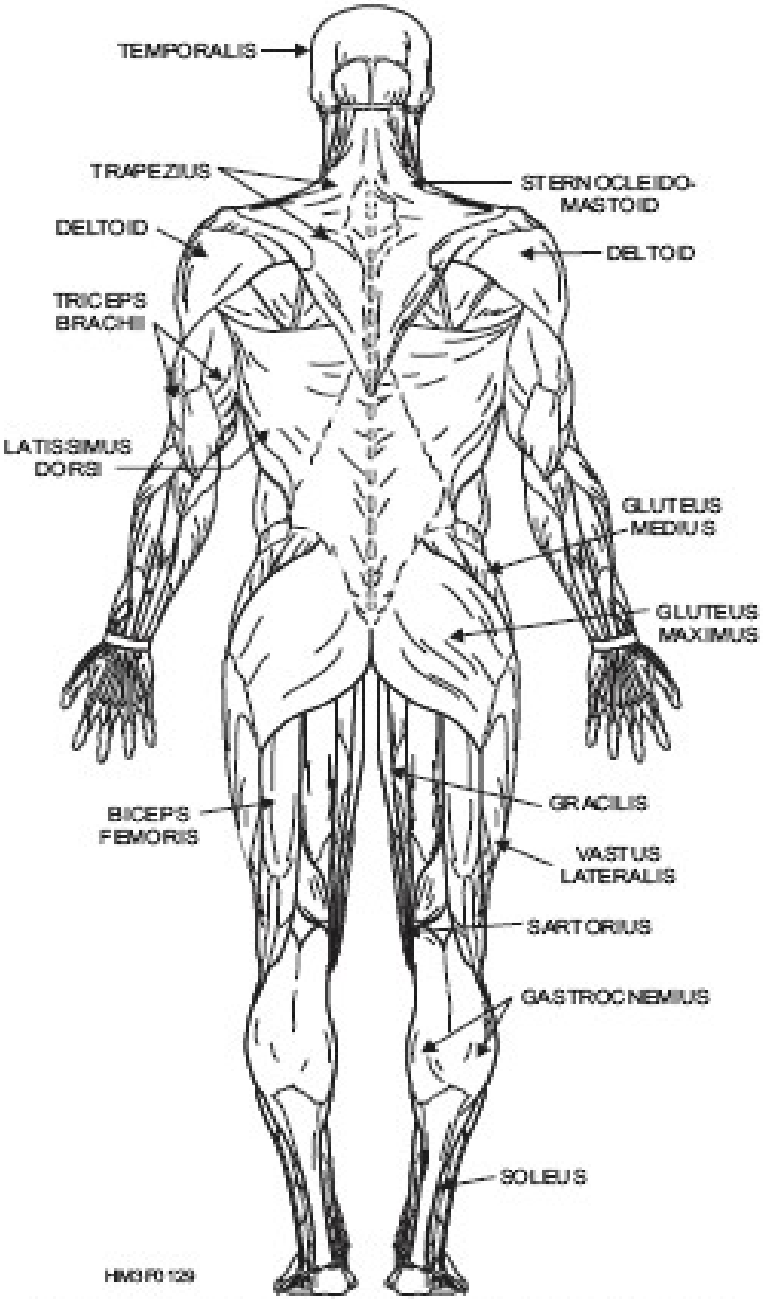


Figure 1-29.—Posterior view of superficial skeletal muscles.

INTEGUMENTARY SYSYTEM

Integumentary System

- Organs comprised of tissue grouped together to form organs or group of organs w/ special functions.
- Skin, Hair follicles, sebaceous glands, and sweat glands.

Integumentary System

- Skin has two layers.
- Epidermis – outer layer.
- Dermis – ‘true skin’.
- Contains blood vessels, nerves, smooth muscles, and skin appendages.

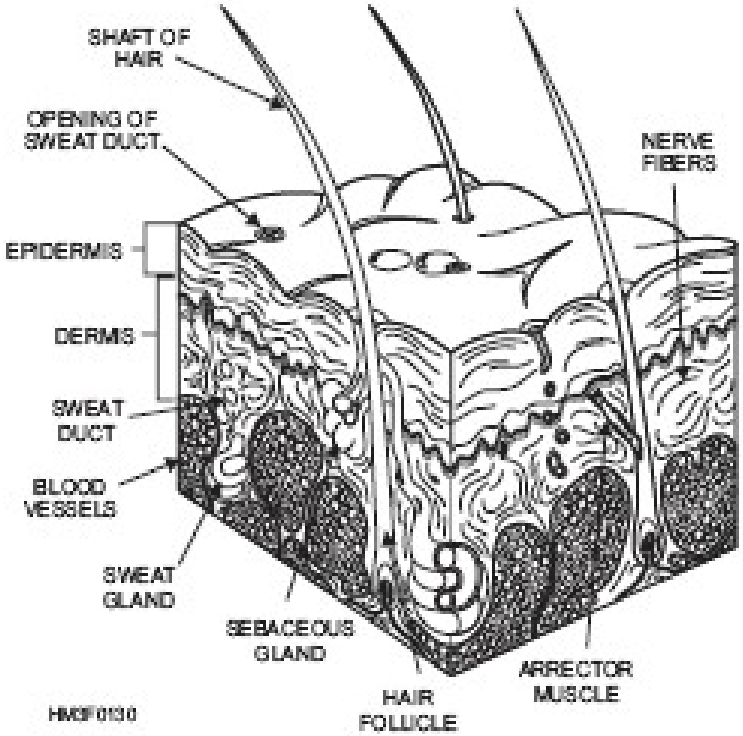


Figure 1-30.—Cross section of the skin.

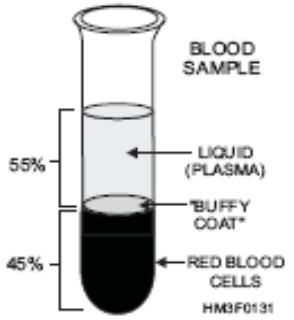
CIRCULATORY SYSTEM

Circulatory System

- Also called the vascular system.
- Consists of blood, heart, and blood vessels.
- Closed system.
- Function is: move blood between the cell and organs of other systems.

Circulatory System con't

- Blood – fluid tissue.
- 5-6 liters in an adult.
- Plasma – liquid part of the blood. 55% of whole blood. Contains fibrinogen.
- Blood Cells – 45% whole blood. Platelets, RBC, WBC.



re 1-31.—Blood sample illustrating blood components.

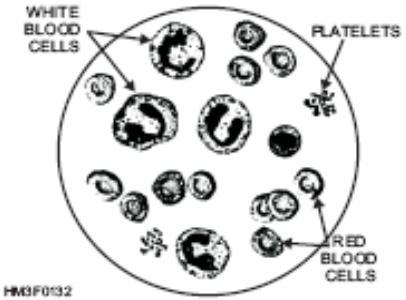


Figure 1-32.—A blood smear showing red blood cells, white blood cells, and platelets.

Circulatory System con’t

- Spleen is graveyard for old and worn out RBC’s when they are removed from the blood stream.
- Color of Blood.
- Dark Red – Venous.
- Bright Red – Arterial.

Circulatory System con't

- Heart.
- Enclosed in sac – pericardium. Has pericardial fluid in it. Why?
- Inner surface – Endo.
- Upper chambers – atrium.
- Lower chambers – ventricles.
- Separated by – Interventricular septum

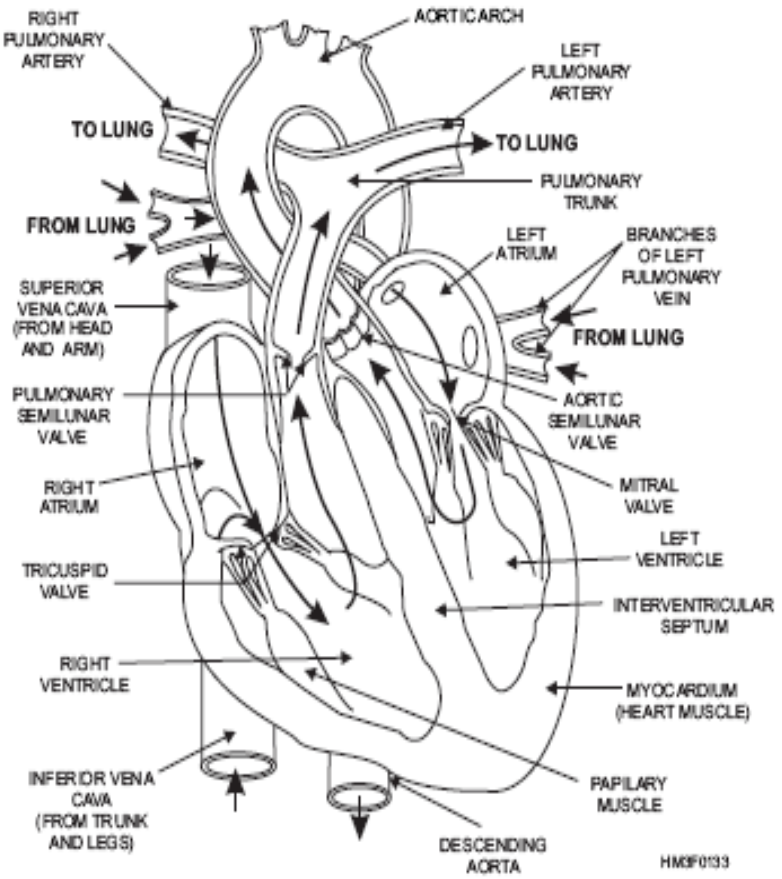
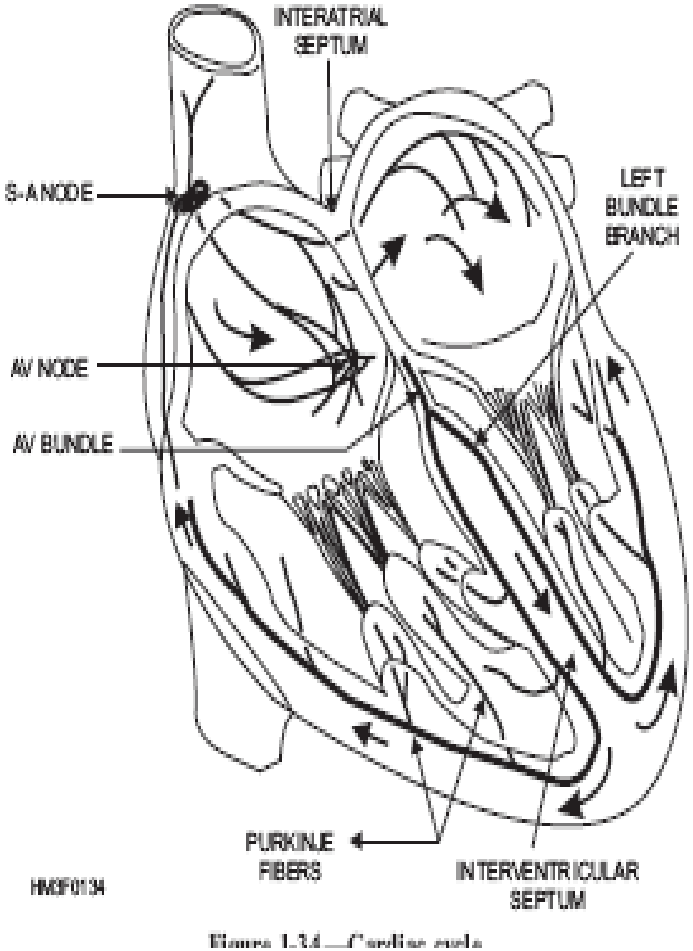


Figure 1-33.—Frontal view of the heart—arrows indicate blood flow.

Circulatory System con’t

- Cardiac cycle – initiate and distribute electric impulses.
- SA Node – pacemaker.
- AV Node – atrioventricular node.
- Junctional fibers.
- Bundle branches.
- Purkinje fibers.



Circulatory System con't

- Blood Pressure – pressure exerts on the walls of the arteries.
- Diastolic Pressure – relaxation of the heart and the left over pressure in the Aorta.
- Systolic Pressure – Contraction of the heart and pressure located in the artery.
- Pulse Pressure – the difference between the systolic and diastolic pressure.
- Why is this important?
- Normal BP Adult?

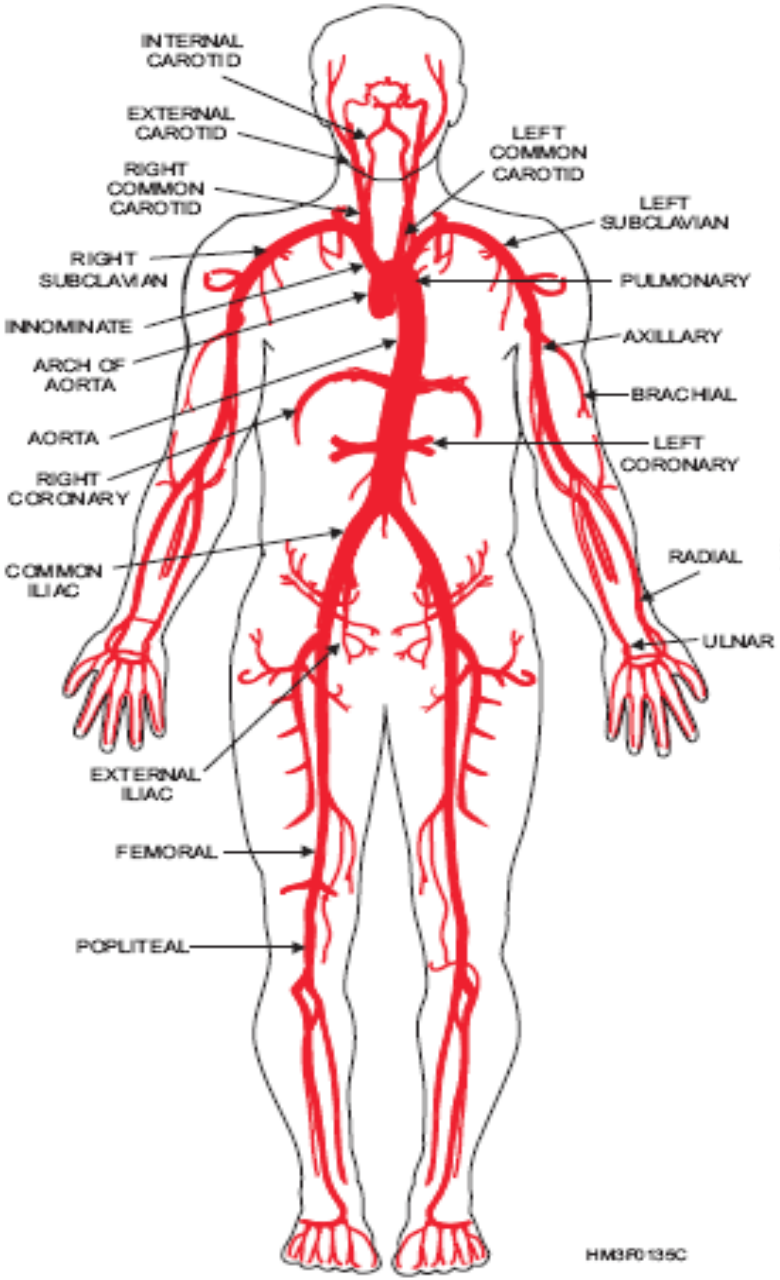


Figure 1-35.—Principal vessels of the arterial system.

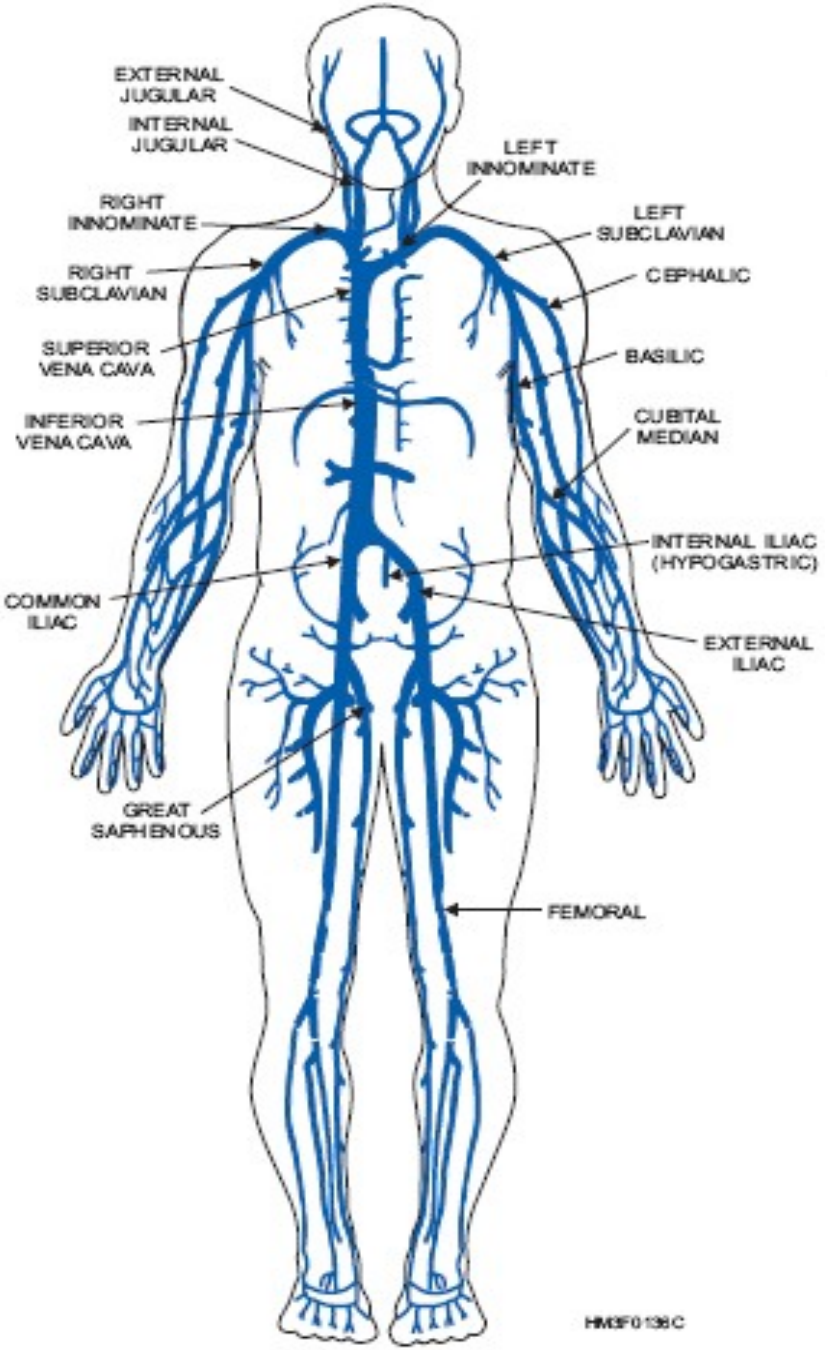


Figure 1-36.—Principal vessels of the venous system.

LYMPHATIC SYSTEM

Lymphatic System

- Interstitial fluid: all tissue cells of the body are continuously bathed in.
- Fluid is formed when blood plasma leaks through minute pores of the capillaries.
- Continual exchange of fluid of blood and tissue to share nutrients and get rid of waste.
- Helps defend the tissues against infections by supporting the activities of the lymphocytes.
- They help give immunity/resistance to the effects of specific disease causing agents.

Pathways of the Lymphatic System

- Lymphatic Capillaries: thin walled/closed end tubes. Parallel bloc capillary networks.
- Once fluid (interstitial) enters the Lymphatic capillaries it is calle Lymph fluid.

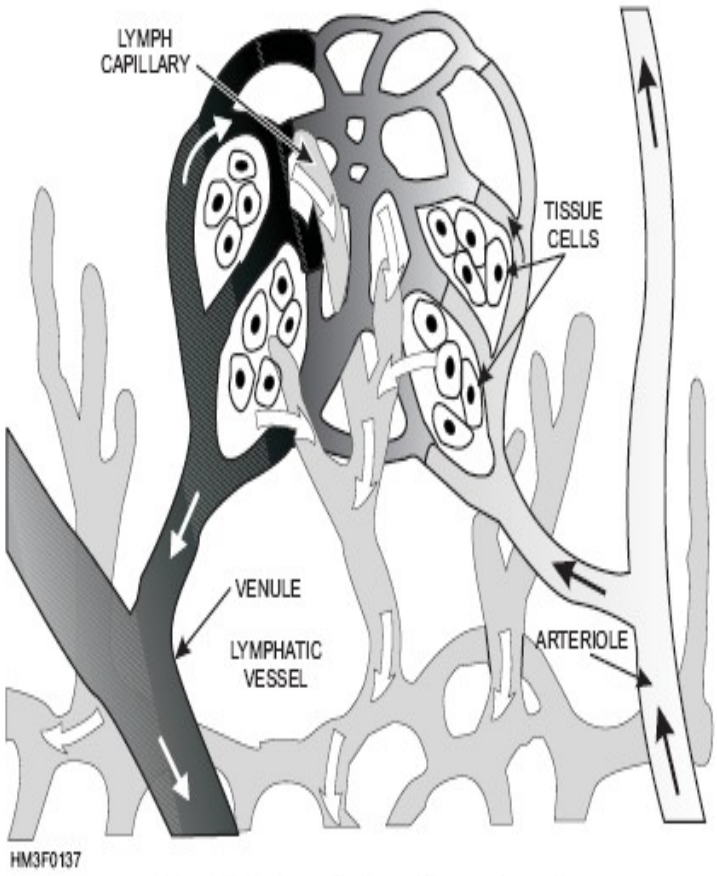


Figure 1-37.—Lymphatic capillary and vessel.

Pathways of the Lymphatic System

- Vessels are similar to veins since they both have valves to prevent fluid from backing up.
- Lymphatic Trunks and Ducts: drain lymph from large regions of the body. Named for the region they serve.
- Lymph Nodes: Are not true glands. Found in groups of 2-15 around the body.
- They filter bacteria and particles from the lymph system.
- They contain macrophages, which eat and destroy foreign substances.

RESPIRATORY SYSTEM

Respiratory System

- Respiration: exchange of O2 and CO2.
- Physical/Mechanical respiration: motion of rib cage/diaphragm.
- Physiological respiration: Exchange of gases.
- Anatomy of System: Nasal Cavity; mouth; pharynx, larynx, trachea; bronchi; bronchioles; alveoli; lungs; pleurae; mediastinum; diaphragm; intercostal muscles.

Respiratory System con’t

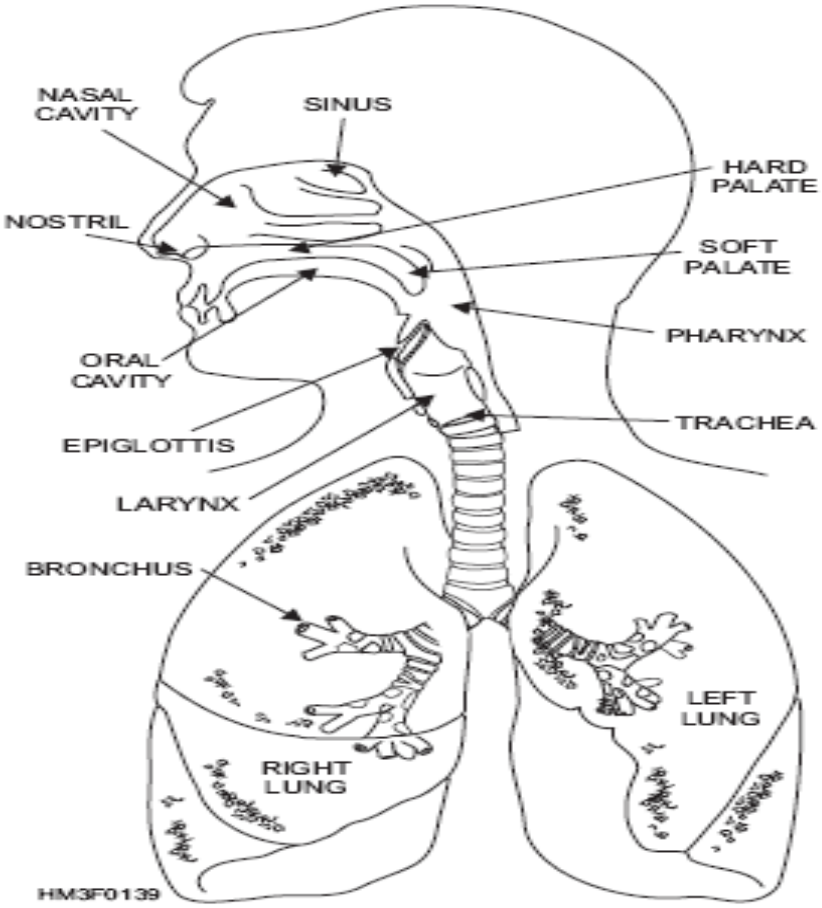


Figure 1-39.—Organs of the respiratory system.

Respiratory System con’t

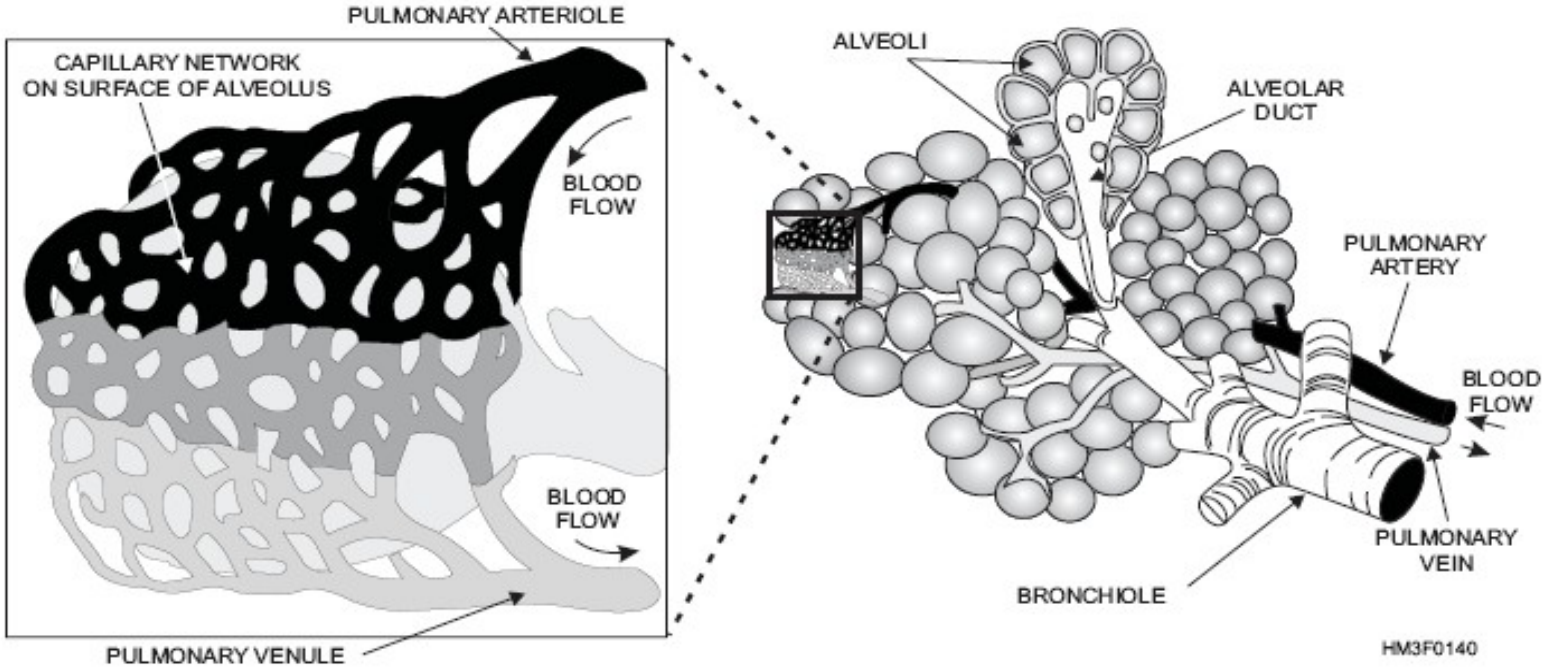


Figure 1-40.—Bronchiole and alveoli.

Respiratory System con’t

- Process of Respiration: movements of breathing are controlled by the respiration center of the brain.
- Nerves pass down from the brain to the neck, chest wall, and diaphragm.
- Phrenic Nerve: controls diaphragm.
- Vagus Nerve: controls larynx.
- Intercostal Nerves: Control intercostal muscles.
- Normal respiration for Adult: 12-20/per min.

  Child: 15-30/per min.

  Infant: 30-50/per min.

NERVOUS SYSTEM

Nervous System

- Divided into two groups: Central Nervous System and Autonomic Nervous System.

- Further subdivided into: Sympathetic and Parasympathetic Nervous Systems.

Nervous System con't

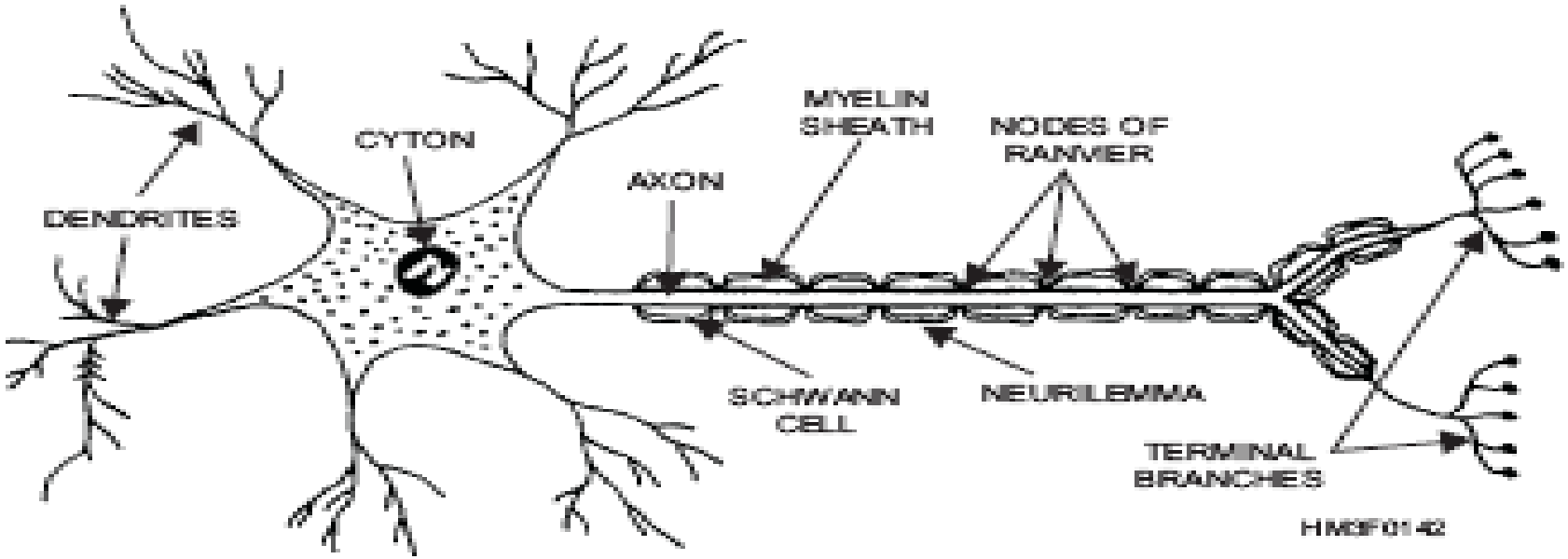


Figure 1–42.—The neuron and its parts.

Nervous System con’t

- Nerves: Cordlike bundle of nerve fibers held together with connective tissue.
- Conduct impulses into the brain/spinal cord – Sensory Nerves.
- Carry impulses to muscles and glands – Motor Nerves.
- Included both types: Mixed Nerves.

Central Nervous System

- Brain and Spinal Cord.
- Brain: Two main divisions – Cerebrum and Cerebellum.
- Cerebrum: largest and most superior portion of the brain.
- Outer surface: “cortex” or gray matter.
- Medulla: white matter.
- Frontal Lobe: Higher mental process such as memory.
- Parietal Lobe: General sensations.
- Occipital Lobe: Sense of Sight.
- Temporal Lobe: Hearing.
- What would happen if you had a co-contra-co?

Central Nervous System con't

- Cerebellum: situated posterior to the brain stem.
- Contains: Pons, Mid-brain; Medulla Oblongata.
- Inferior to the Occipital lobe.
- Main function: balance, harmony with the motions initiated by the Cerebrum.
- Pons/Medulla Oblongata: Form the brain stem.
- Medulla Oblongata: inferior portion of the brain and connects the spinal cord with C-1.
- Controls heart action; respiration; circulation: vital processes such as blood pressure.

Central Nervous System con't

- Meninges: Three layers of membranes that cover the outer surface of the brain.
- Dura Matter (outer layer).
- Arachnoid Membrane (middle layer).
- Pia Matter (vascular inner-most layer).

- What is the inflammation of the Meninges?
- CSF.
- What is a reflex arc?

Central Nervous System con't

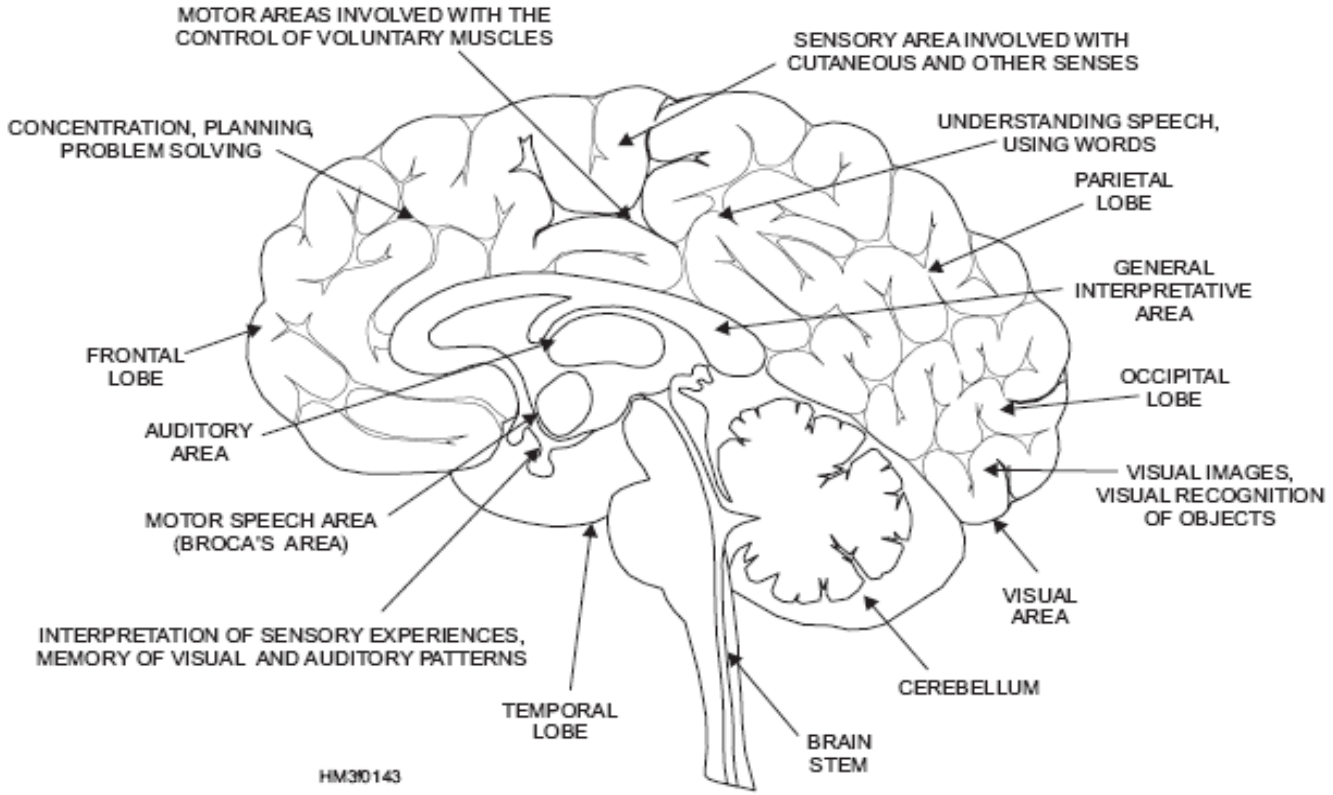


Figure 1-43.—Functional areas of the brain.

Peripheral Nervous System

- Nerves that branch out from the CNS and connect to other parts of the body.
- Includes 12 pairs of Cranial Nerves and 31 pairs of Spinal Nerves.
- They carry both involuntary and voluntary impulses.
- Name some of each…..

Peripheral Nervous System con’t

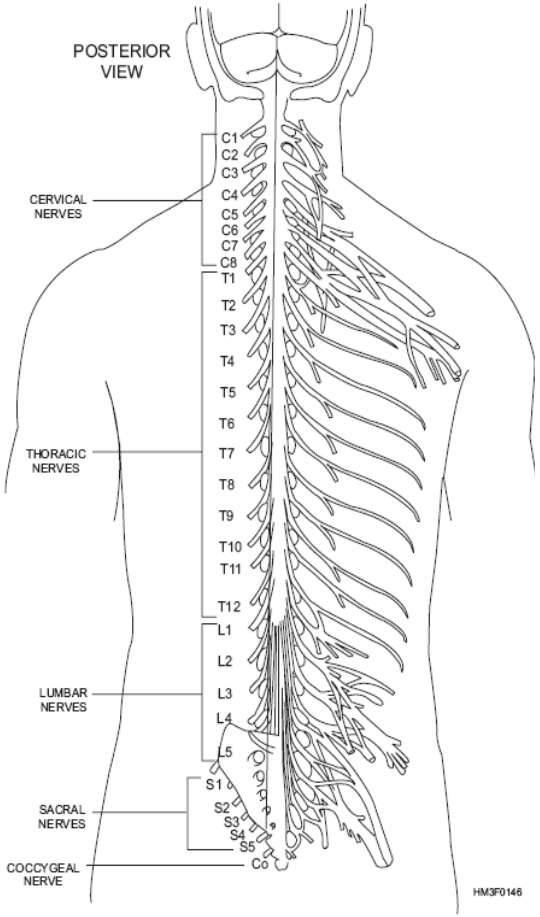


Figure 1-46.—Spinal nerves.

Peripheral Nervous System con't

Table 1-3.—Cranial Nerves

CRANIAL NERVE	FUNCTION(S)
Olfactory	Sense of smell.
Optic	Vision.
Oculomotor	Eye movement, size of pupil, and eye focus.
Trochlear	Eye movements.
Trigeminal	Sensations of head and face and chewing movements.
Abducens	Abduction of eye (muscles that turn eye outward).
Facial	Facial expressions, secretion of saliva, and sense of taste.
Acoustic	Sense of hearing and balance or equilibrium sense.
Glossopharyngeal	Taste and other sensations of the tongue, swallowing movements, secretion of saliva.
Vagus	Sensations of movement (e.g., decrease in heart rate, increase in peristalsis, and contracting of muscles for voice production).
Accessory	Shoulder movements, turning movements of the head, and voice production.
Hypoglossal	Tongue movements.

Autonomic Nervous System

- Portion of the PNS that functions independently.
- Regulates smooth muscles, cardiac muscles, digestive tubes, blood vessels, sweat & digestive glands, and certain endocrine glands.
- ANS has 2 divisions.
- Sympathetic Nervous System: “fight or flight.”
- Parasympathetic Nervous System: most active under calm and restful situations.

ENDOCRINE SYSTEM

Endocrine System

- Homeostasis: self-balancing act of the body's internal environment.
- Hormones: chemical messengers.
- Endocrine glands secrete hormones directly into blood.
- They have no ducts
- Hormone producing glands: Hypothalamus, Pituitary, Thyroid, Parathyroid, Adrenals, Pancreas, and Gonads (Ovary/Testes).

Endocrine System con't

- Hypothalamus: synthesizes chemicals that are secreted to the Pituitary Gland to stimulate the release of hormones and regulate body temps.
- Pituitary Gland: Master Gland. 2 parts

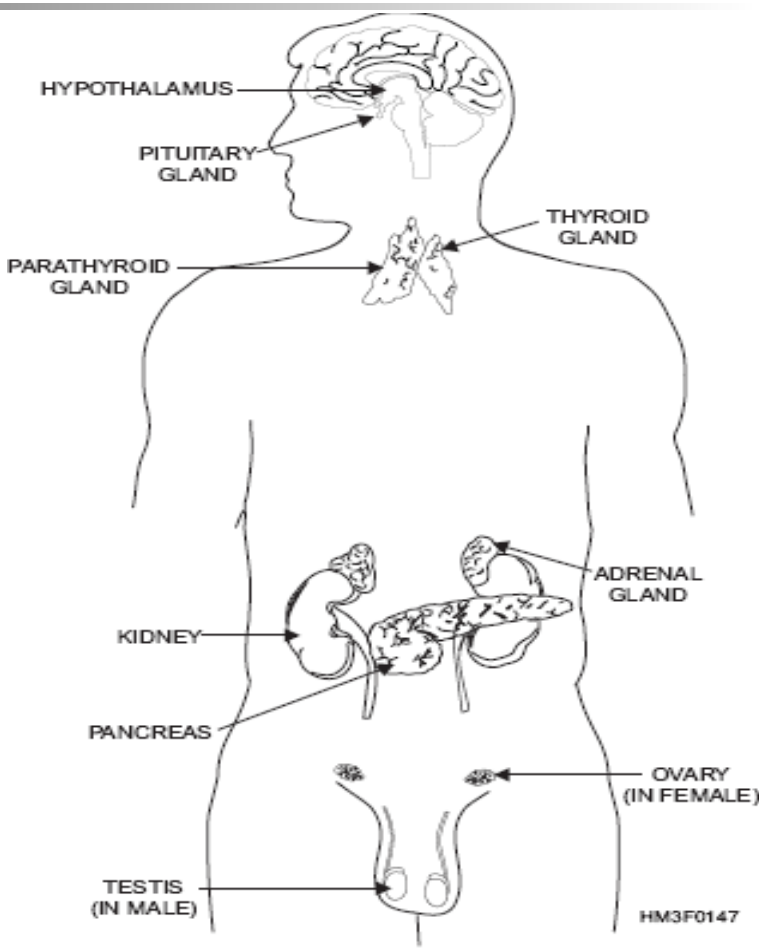


Figure 1-47.—Major endocrine glands.

Endocrine System con't

- Thyroid: Shaped like a butterfly and located in the anterior part of the neck below the larynx.
- Secretes iodine containing hormone Thyroxin. Controls metabolism.
- Parathyroid: 4 round bodies posterior to the Thyroid gland.
- Adrenal Glands: Produce 3 steroid hormones, Epinephrine, and Norepinephrine.

Endocrine System con't

- Pancreas: Contains 2 secretor tissues.
- Islands of Langerhans: Alpha, Beta, and Delta cells.
- Alpha: Secrete Glucagon.
- Beta: Secrete Insulin.
- Delta: Somatostatin.
- When islet cells are destroyed or stop functioning, the sugar absorbed from the intestine remains in the blood and excess sugar is excreted by the Kidneys.
- Diabetes Mellitus.

Endocrine System con’t

- Gonads.
- Testes: Male. Produces Testosterone and influences development and maintenance of the male accessory sex organs.
- Ovary: Produce estrogen and Progesterone.

SENSORY SYSTEM

Sensory System

- Informs the brain of changes that are taking place inside and outside the body.
- Hearing, Sight, Taste, Smell, Touch.
- Smell.
- Which Cranial nerve is it associated with?
- Sight: Assisted by the eye brows, eye lashes, eyelids, and lacrimal apparatus.
- Lacrimal Apparatus: produces tears and drain them from the surface of the eyeball.

Sensory System con't

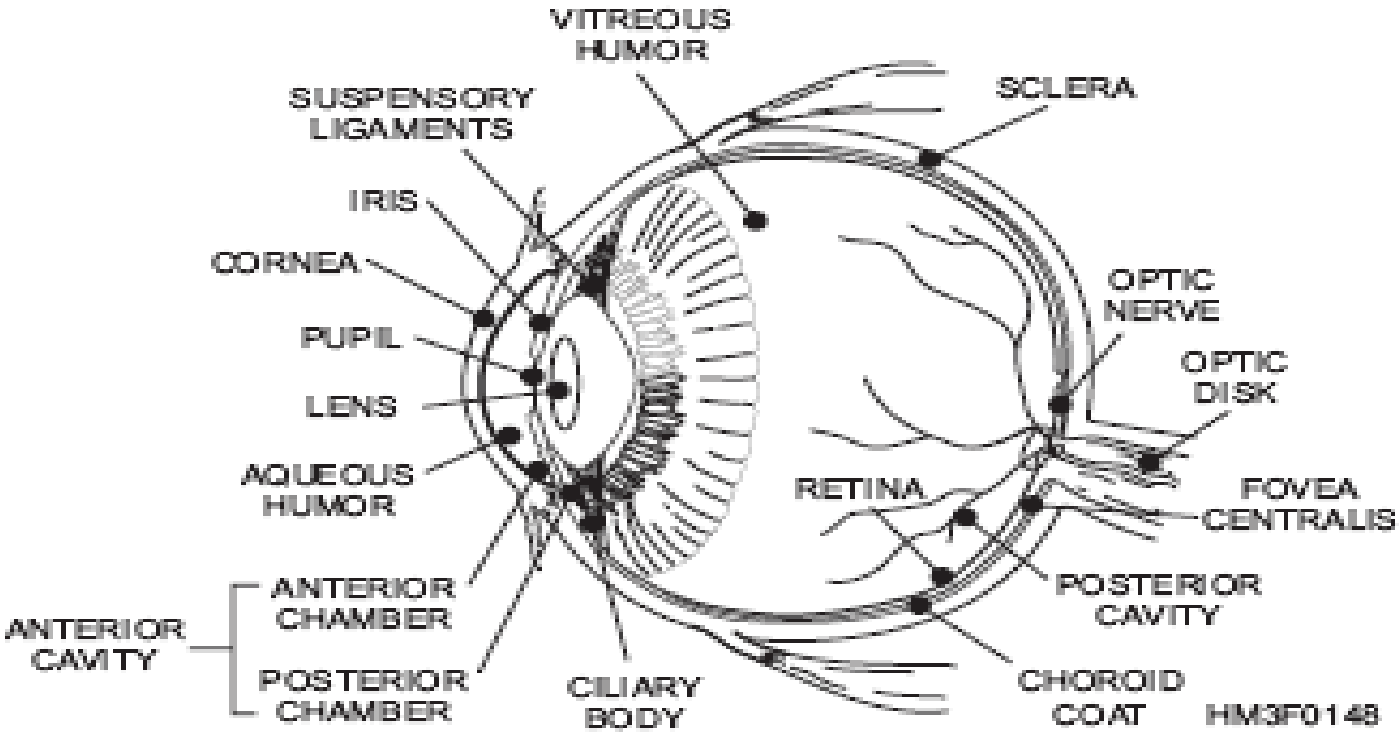


Figure 1-48.—Transverse section of the eye.

Sensory System con’t

- Vision Process: Rays of light passing through the Cornea. Image is received by the lens, by way of the Iris. Leaving the lens image falls on Rods or Cones in the Retina. Then carried to the brain via the Optic Nerve.
- Image received by the Retina is upside down, but the brain turns it right-side up.
- Refraction: Deflection or bending of light rays when light passes through substances of varying density in the eye (cornea, lens, aqueous and vitreous humor)

Sensory System con't

- Accommodation: Lens increases or decreases the curvature to refract light rays into focus on the Fovea Centralis.
- Convergence: Movement of 2 globes toward midline causing object to come into focus on corresponding points of the 2 Retinas.

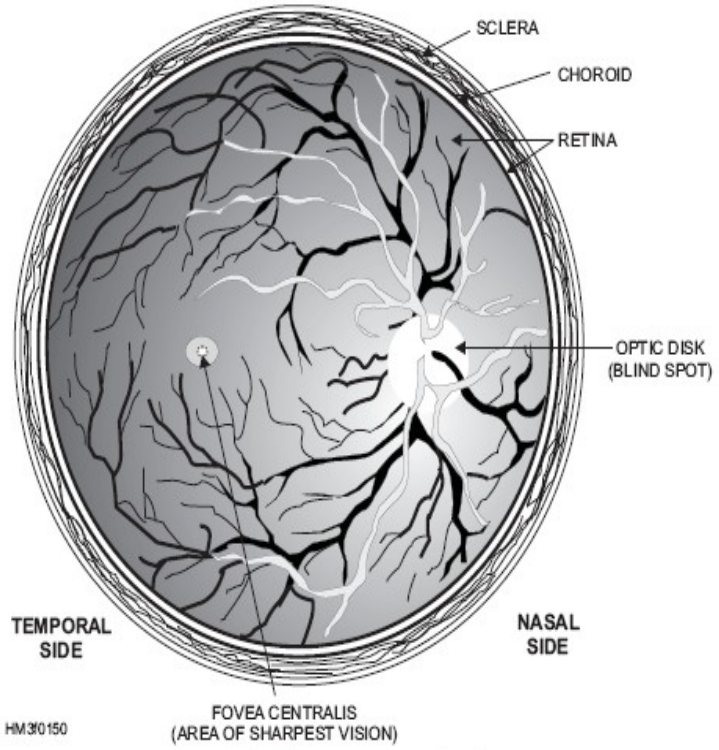


Figure 1-50.—Ophthalmoscope view of the eye.

Sensory System con’t

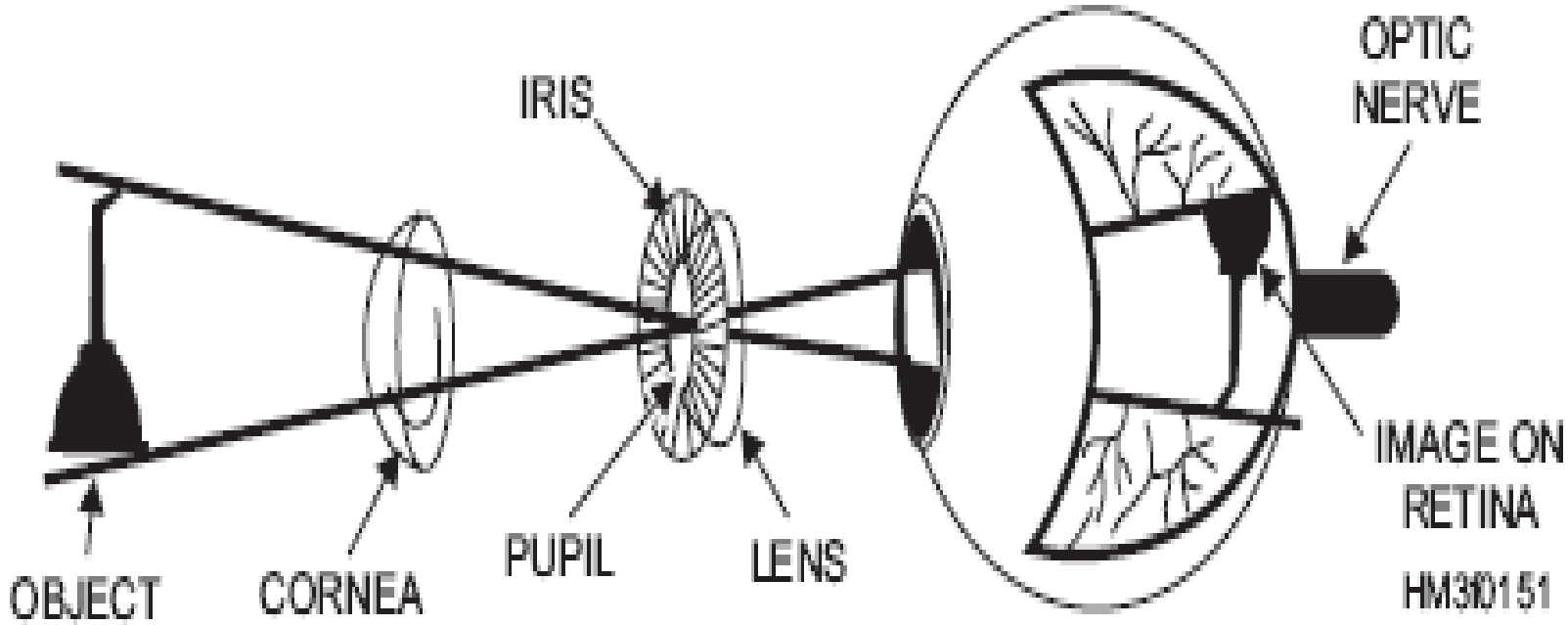


Figure 1-51.—The vision process.

Sensory System con’t

- Hearing: Ear is the primary organ of hearing.
- Divided into 3 parts.
- External: Auricle, External Auditory Canal, Tympanic Membrane.
- Middle: 3 Auditory bones (Malleus, Incus, and Stapes) and Eustachian Tube.
- Inner: Filled with fluid called Endolymph.

Sensory System con't

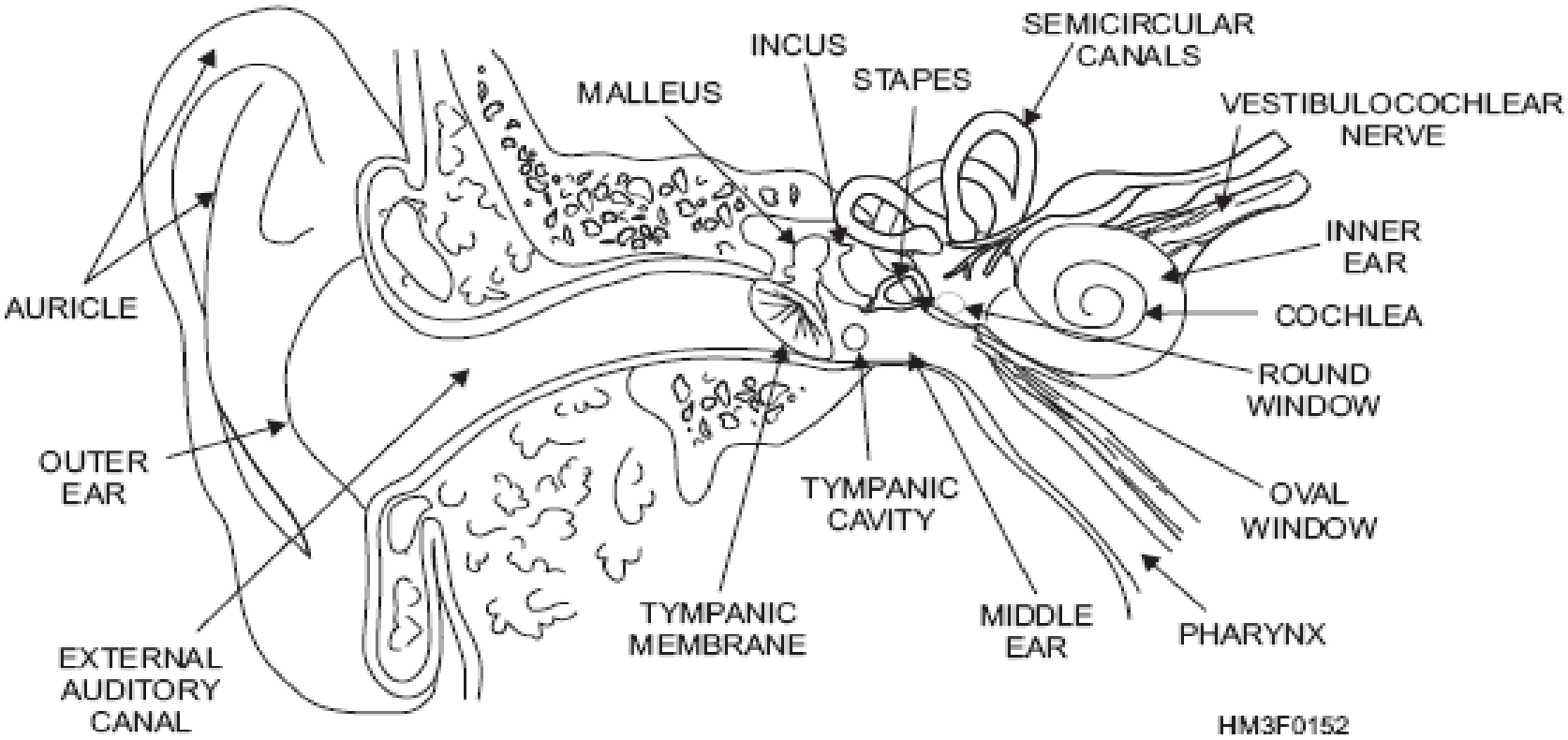


Figure 1-52.—Major parts of the ear.

Sensory System con’t

- Touch
- Receptors are classified as to location, structure, and types of stimuli activating them.
- Superficial Receptors: Exteroceptors.
- Deep Receptors: Proprioceptors.
- Internal Receptors: Visceroceptors.

Sensory System con't

Table 1-4.—Types of Receptors, Their Location, and Affected Sense

TYPES	LOCATIONS	SENSES
Superficial receptors	At or near surface of body	Touch, pressure, heat, cold, and pain
Deep receptors	In muscles, tendons, and joints	Sense of position and movement
Internal receptors	In the internal organs and blood vessel walls	Usually none (except hunger, nausea, pain from stimuli such as chemicals (e.g., aspirin) and distension (e.g., stomach expansion from gas))

DIGESTIVE SYSTEM

Digestive System

- Includes organs that digest and absorb food substances and eliminate the unused residuals.
- Contains Alimentary canal.
- Digestion is both chemical and mechanical.
- Mechanical digestion: occurs when food is chewed, swallowed and propelled by a wave-like motion, Peristalsis.
- Chemical digestion: consists of the changes of food with aid of digestive enzymes into solutions and simple compounds.

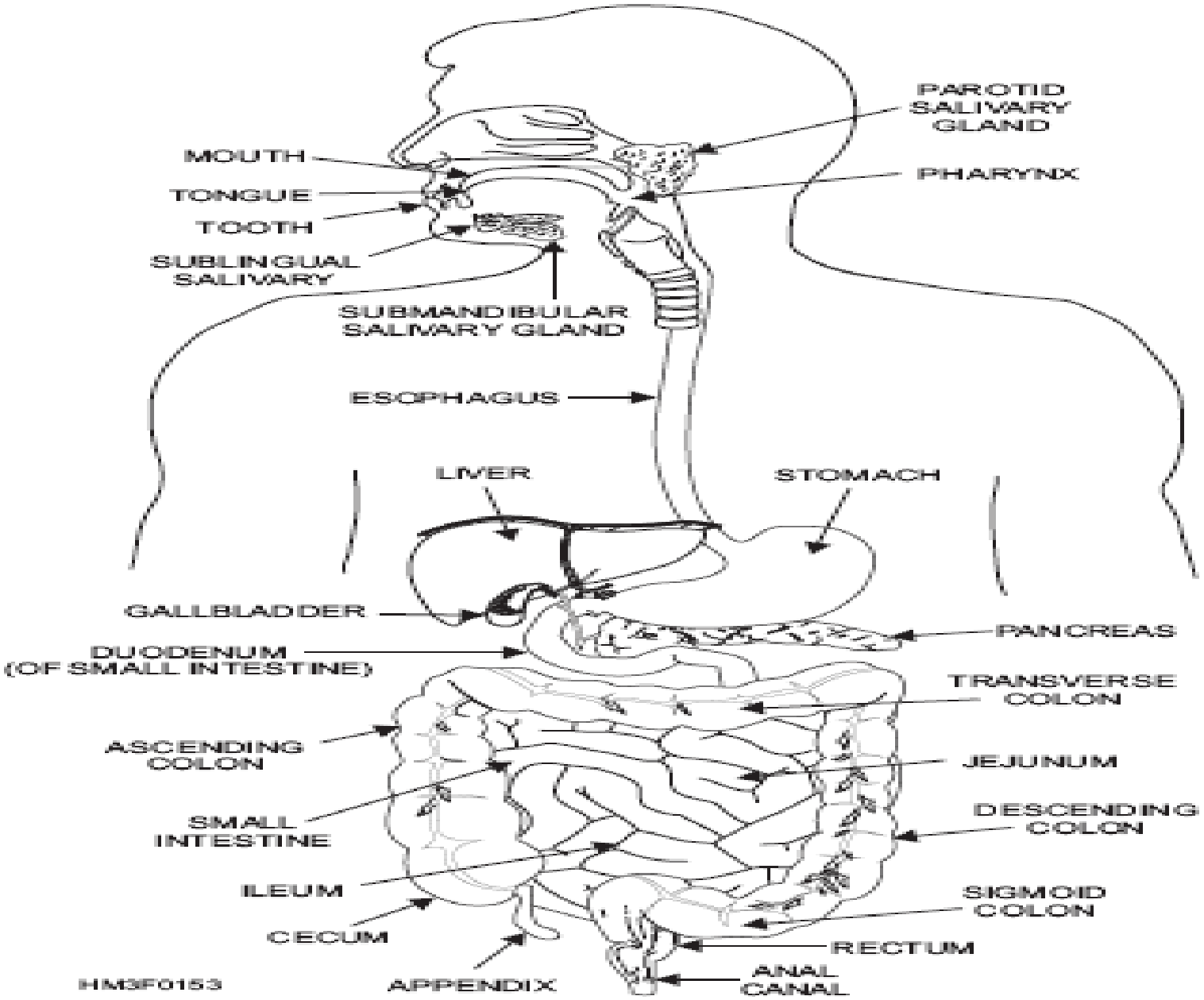


Figure 1–53.—The digestive system.

Digestive System con't

Table 1-5.—Principal Digestive Juices

Digestive Juice	Source	Substance Acted Upon	Product
Amylase	Salivary glands and pancreas	Starch	Complex sugars (maltose)
Hydrochloric acid	Gastric glands	Pepsinogen (Proteins)	Pepsin (Split proteins)
Bile	Liver	Fats	Emulsified fats
Proteinase	Pancreas	Proteins and split proteins	Peptides and polypeptides
Lipase	Pancreas	Fats (triglycerides)	Fatty acids and glycerol
Carbohydrase	Intestinal glands	Complex sugars (maltose, sucrose, and lactose)	Simple sugars (glucose, fructose, and galactose)
Peptidase	Intestinal glands	Peptides and polypeptides	Amino acids

Digestive System con’t

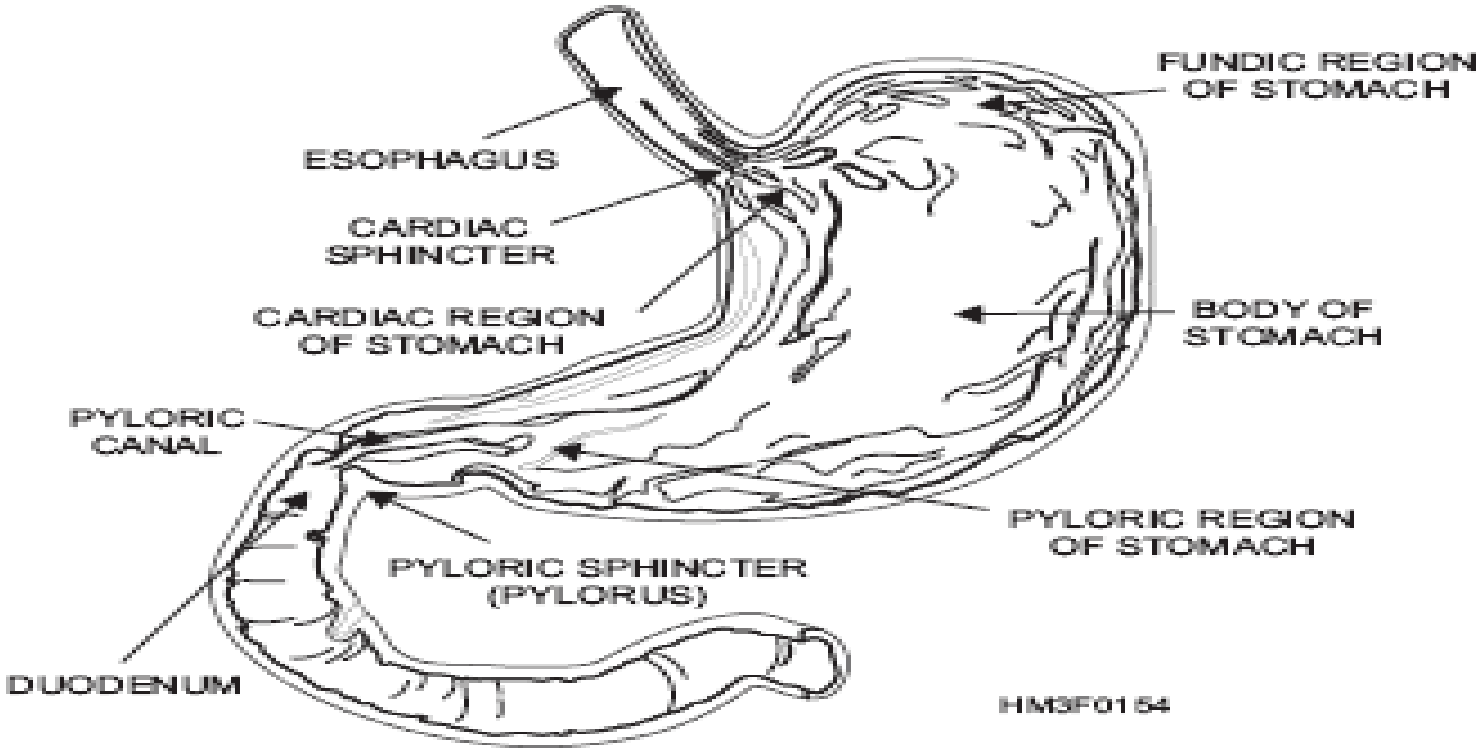


Figure 1-54.—Major regions of the stomach.

URINARY SYSTEM

Urinary System

- Primary filtering system of the body.
- Composed of Kidney's, Urinary bladder, Ureters, and Urethra.
- All parts are the same in both sexes except for the length of the Urethra.
- Kidney: 2 large bean shaped organs designed to filter waste material from the blood. Assist in controlling the rate of red blood cells formation, regulation of B/P, absorption of calcium ions, and the volume, composition and PH of the body.

Urinary System con't

- Located in the upper postior part of the Abdominal cavity. The suprarenal (adrenal) gland sits on top of each kidney.
- Renal Blood Vessels: Renal Artery supplies blood to the kidneys.
- Nephrons: Functional unit of the kidney's. 1 Millions of them in each Kidney.
- Average adult excretes 1,000 to 1,500 ml per day.

Urinary System con’t

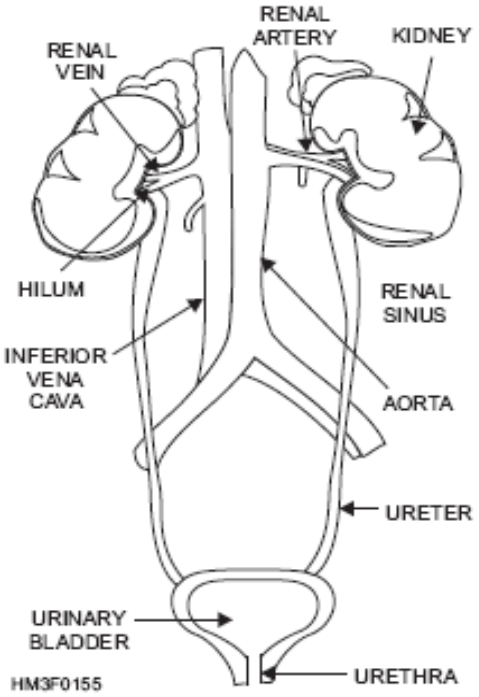
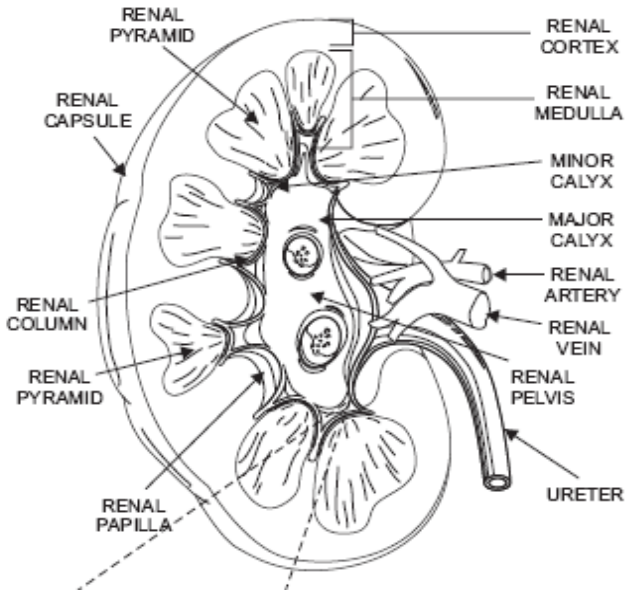


Figure 1-55.—The urinary system.



REPRODUCTIVE SYSTEM

Male Reproductive System

- Testes: Primary Male sex organs.
- Produce sperm cells and male hormones.
- Testes are oval glands that are suspended inside a sac by a spermatic cord.
- Spermatic cord is formed by the vas deferens, arteries, veins, and lymphatics, and nerves, all bound together by connective tissue.

Male Reproductive System con't

- Internal Accessory Organs: epididmis, vas deferens, ejaculatory ducts, seminal vesicles, urethra, prostrate gland, bulbourethral glands, and semen.
- External Accessory Organs: Scrotum and Penis.

Male Reproductive System con't

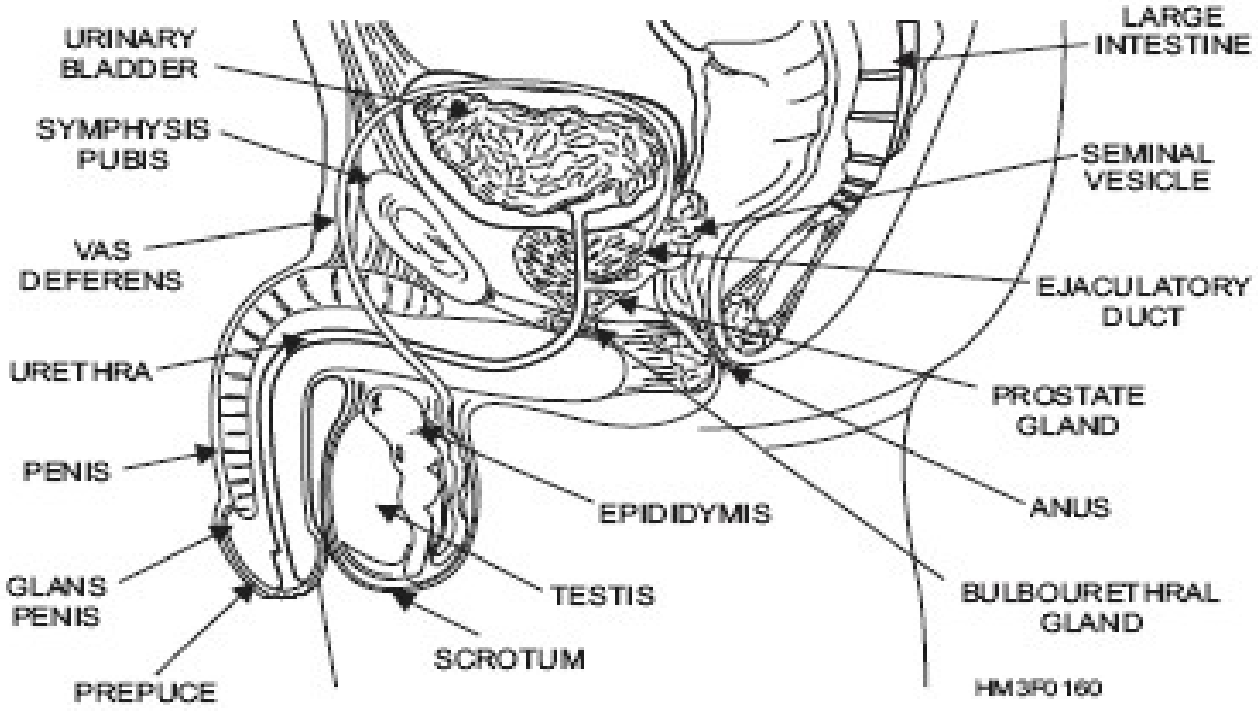


Figure 1-60.—The male reproductive system.

Female Reproductive System

- Specialized to produce and maintain Egg cells; to transport eggs to the site of fertilization; to produce and environment for developing the baby; to give birth; produce female hormones.
- Includes Ovaries, Fallopian tubes, Uterus, Vagina, Labia Majora & Minora, Clitoris, Vestibula, Mammary Glands.

Female Reproductive System con't

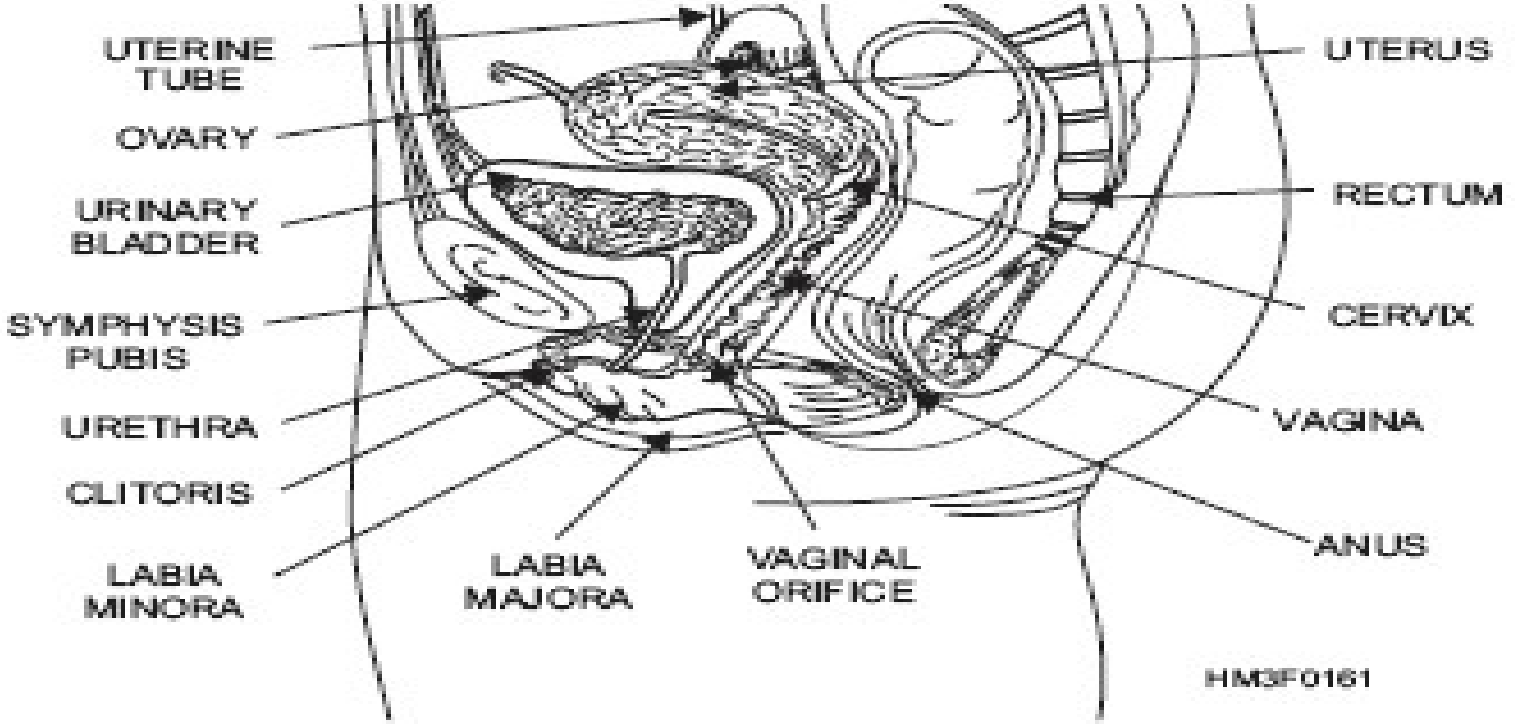


Figure 1-61.—The female reproductive system.

Female Reproductive System con't

- Ovulation: Stimulated by hormones from Anterior Pituitary gland. Mature follicle released from Ovary. Enters fallopian tube where it is either fertilized with sperm or it will degenerate.
- Occurs once a month.
- Generally on day 14 of a regular 28 day menstrual cycle.
- Estrogen and Progesterone are produced by ovaries, adrenal glands, and placenta (during pregnancy.)

Female Reproductive System con't

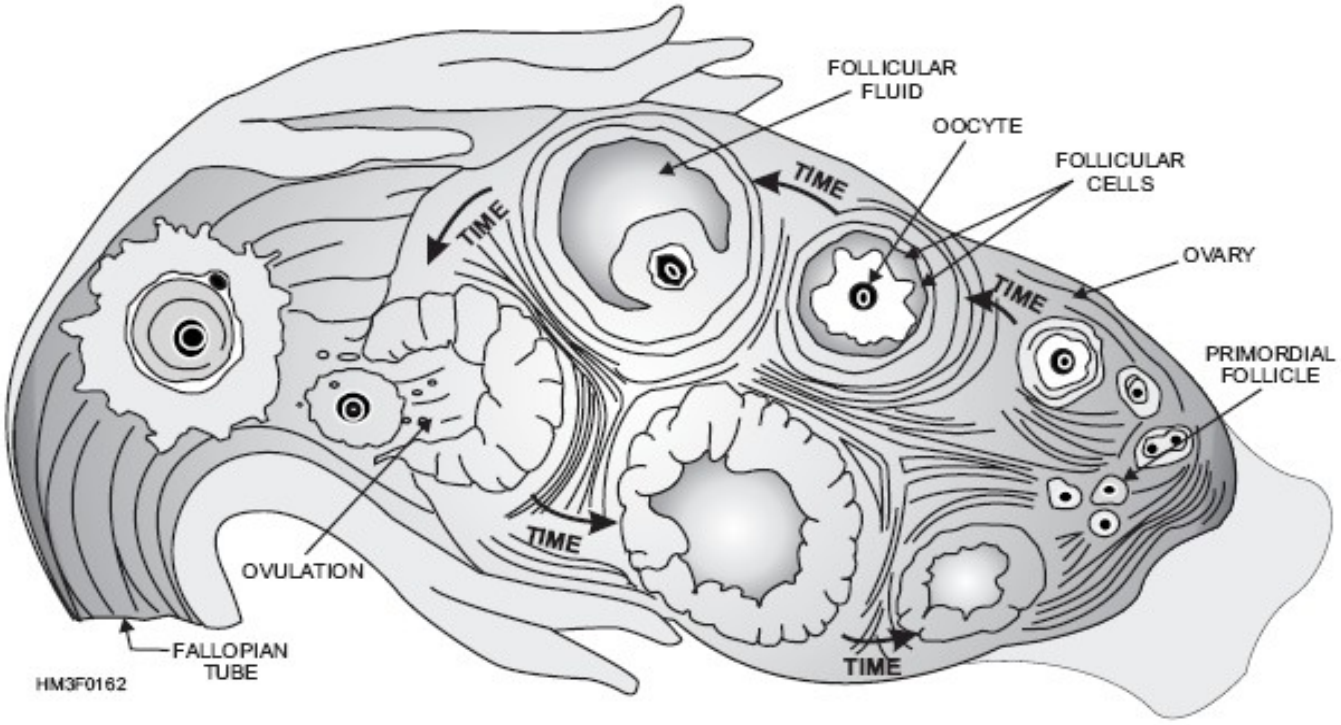


Figure 1-62.—Ovulation process.

Female Reproductive System con't

- Female Reproductive Cycle: Can start around age 11.
- Menstrual bleeding occurs when the endometrial lining starts to slough off from the walls of the Uterus and blood comes out of the vagina. This is day 1 of the cycle and can last up to 7 days.
- Postmenstrual phase: last day of cycle and before ovulation.

Female Reproductive System con't

- Endometrial cells become thicker in the Uterus which develop under the influence of Estrogen.
- Ovulation usually occurs on day 14 or 15.
- Pre-menstrual phase is the time between ovulation and menses.
- During this phase the ovum travels through the fallopian tubes to the uterus.
- If it is fertilized then it will implant into the side of the uterus. If not then menses being and the process starts all over again.